

Final Report



Feasibility of Scaling Up Compost Production & Distribution in Rangpur

June, 2007



Waste Concern Consultants

EXECUTIVE SUMMARY

This study has been commissioned by KATALYST- a project of European Donors for Bangladesh with a goal to improve competitiveness of business in sectors having ample opportunities. One of the areas where KATALYST has been working for the last few years is to support compost producers in the rural areas to improve their technology and found that there is a growing demand for the compost amongst the farmers in the midst of few number of commercial compost producing companies. Field demonstration on maize and vegetable cultivation using compost has also shown encouraging results. Now it intends to expand up this activity to benefit larger number of farmers.

Against the backdrop of growing demand for compost among the farmers in the face of limited production capacity of existing compost producers, KATALYST intends to collaborate with private companies for increase the production and distribution of compost. Since developing a feasible model for increased compost production is a complex task and involves a number of value chain actors, a study is essential to assess technical and economic feasibility, as well as to identify effective business model for raw material collection as well as compost production and distribution.

In order to obtain in depth information about availability of raw material for composting and to develop a viable approach to meet the growing demand for compost in Rangpur , this study was launched and contracted out to Waste Concern Consultants- a specialized research and consultancy firm working in waste, energy and environmental sector in Bangladesh for more than a decade.

This study is mainly based on primary data, as there was an acute lack of secondary data. The key findings of this study are as follows:

1. It has been found that 168,669 tons of compost is used in rural Rangpur, out of which only 2631 tons which represents 1.6% of the total compost used is purchased from the market and the rest 98.4% is produced by the farmers themselves within their backyards using traditional composting methods which have low efficiency.
2. The compost sold in the market is worth Tk. 3.95 crore. There are two types of compost sold in the market, one is raw compost and other one is enriched bio fertilizer/compost. In terms of percentage, 70% of the compost is raw compost, while the rest 30% is enriched compost. Marketing of enriched compost requires approval from the government.
3. It was also revealed from the field survey that there is an estimated demand of 319,546 tons of compost per year.
4. As such there is a shortfall of minimum 150,877 tons of compost per year in Rangpur which in terms of percentage is 47%.
5. Biomass is generated from four sources in the rural areas, which are agricultural, animal, tree and household waste. Total available biomass in rural area is 10.57 tons/household/year of which 40% is used as fuel and 23% is used for composting.
6. Biomass in the urban areas is generated from animal sources, trees and household waste. Based on the field survey total generated biomass in the urban areas of Rangpur is estimated at 3.78 tons/household per year. Almost all the biomass generated in the households is used as fuel and small portion as animal feed. At present without alternative fuel, only potential is to use household waste which amounts to 0.14 tons/household/year for composting.

7. In case alternate fuel is available for the households in urban areas at least 3.36 tons/household per year biomass can be made available for composting purpose, which can generate at least 96,534 tons of compost per year. However, this is not feasible at present moment.
8. Only 1.6% of the total compost used in Rangpur is sold through markets, however, there is a well organized marketing channel existing in the district. There is a network of dealers and retailers marketing mainly chemical fertilizers for different companies. It was found from the field survey that 13% the retailers were selling compost. No dealer was found to be marketing compost or enriched compost.
9. Retailers came to know about the benefit of compost through feed back from farmers who had used it. Only 16.7% of the retailers reported that Department of Agriculture Extension (DAE) gave them information to promote compost. As such, government's agriculture extension services do not seem to be active in promoting use of compost amongst the farmers despite clear policies of the government are on record for promoting production of compost
10. To promote compost, both the dealers and retailers have suggested that government's endorsement of the product being marketed is essential along with strict quality control of the product.
11. The compost producing farmers have indicated that too much time required to produce compost using traditional methods is a major barrier as well as lack of technical knowledge to produce good quality of compost is another obstacle.
12. Main crop in Rangpur is rice (Aman/IRRI) while the other crop varies between potato, wheat, maize, vegetable, mustard and tobacco. It has been also found from the survey that due to unpredictable weather condition and high cost of cultivation, some of the farmers are shifting to different crops form paddy.
13. Farmers spend Tk. 5307 to irrigate per bigha of land, which means per ha. cost of Tk. 27,287. 63% of the farmers reported that they are facing serious problem with irrigation due to high diesel price along with severe load shedding which is resulting in lower crop yield.
14. Use of compost can reduce the water requirement for irrigation by 20-30% depending upon the soil type which means there is a good potential to reduce the irrigation cost by Tk. 8,186 per year per ha. Alternatively, use of solar irrigation may be option to reduce fossil fuel based irrigation.
15. There are two major barriers to scale up compost production both at household level as well as commercial level. Availability of sufficient biomass is common for both the household and commercial level. However, at the commercial level the major barrier is permits/licenses required to start a compost business. To establish a compost plant to scale up the production of compost an entrepreneur has to get minimum six to maximum nine permits which are quite a hassle requiring at least one and a half years before one can start a project.

16. In order to reduce the existing demand-supply gap of compost and overcome aforementioned barriers, there are four options which may be used to reduce it are:

Option 1: Change the Existing Composting Technology of Farmers to Increase Compost Production (this option considers no additional amount of waste to be composted from the baseline scenario, only improvement of composting technology);

Option 2: Provide Farmers with Improved Stove and Composting Technology to Increase Compost Production (this option considers 50% additional waste being available with the introduction of improved stove since it requires 50% less biomass for cooking purpose);

Option 3: Private Entrepreneur Investing in the Compost Plant as a Commercial Venture in Rural Areas; and

Option 4: Produce Compost in Urban and Peri Urban Areas Using Private Sector and CDM Based Investment.

17. Until regulatory barriers are removed to ease commercial compost production, to meet the demand supply gap, the best way is to promote option 1 and 2 in partnership with micro credit organizations and composting technology providers.
18. By using option 1, the compost production can be improved to 73% from the baseline situation of 53%; while using option 2, 100% of shortfall can be met. Using option 3, 59% of demand can be met while with option 4 only 54% of the demand can be met compared to baseline condition of 53%. Use of carbon financing can be a very good vehicle to implement all the four options and to minimize the financial risks. In terms of implementation risk, option 1 and 2 contain low risk while option 3 and 4 have medium to high risk.
19. Use of carbon financing using CDM mechanism can also be a very good vehicle to implement all the four options and to minimize the financial risks as well as promote more compost production in the country. It has been found that carbon credits increases composting projects benefit cost ratio significantly.
20. In order to promote compost production in the country using private sector investment, the first priority is to work with the Government to reduce the regulatory barriers associated with the implementation of commercial compost plants.
21. The second major step to promote compost is to maintain a good quality of the product, since both the local and international export market depends upon the quality. International certification such as ISO 22000 or organic certification should be promoted amongst the compost producers.
20. Some recommendations have been made as well as mode of implementation has been identified to promote compost production in Rangpur so that it can be improved from baseline scenario of 47%, to reduce the demand-supply gap.

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GLOSSARY

Aerobic Composting: Environment characterized by bacteria active in the presence of oxygen.

Anaerobic Composting: Environment characterized by bacteria active in the absence of oxygen.

Biodegradable: Any material that can be reduced into finer particles (degraded or decomposed) by microbiological organisms. It may be referred as compostable material.

Biomass: Biomass is the name given to any material which is recently derived from plants that use sunlight to grow. That is plant and animal material such as wood from forests, material left over from agricultural and forestry processes, and organic industrial, human and animal wastes. It is sometimes classified as 'combustible renewables and waste'.

Clean Development Mechanism (CDM): Under the Kyoto Protocol, CDM is a mechanism that allows developed countries to achieve part of their green house gas emissions reduction obligations through investment in projects in developing countries that reduce green house gas or fix or sequester carbon dioxide from the atmosphere.

Certified Emission Reduction (CERs): Green House gas reduction of any CDM project is measured according to internationally agreed methods and are quantified in standard units called Certified Emission Reductions (CERs). These are expressed in tons of carbon dioxide (CO₂) equivalents.

Composting: The controlled biological decomposition of organic solid waste under aerobic conditions.

Compost: The relatively stable decomposed organic material resulting from the composting process. Also referred to as humus.

Decentralized Composting: Means composting of carefully segregated biodegradable local wastes in limited quantities at individual, neighborhood, or ward level with the cooperation of local residents, as close to the source of wastes as possible.

Green House Gas (GHG): Many gases present in the atmosphere are known as green house gases (GHG) because these prevent heat from escaping from the earth. The gases are: carbon dioxide, methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons and sulphur hexafluoride. If the amount of these gases increases in the atmosphere, earth's temperature will increase. Scientists have named this phenomenon 'Global Warming' and the associated changes to the atmosphere are known as 'climate change'.

Inorganic Material: Materials, which are not degraded by microorganisms

Organic Material: Materials Waste material containing carbon. The organic fraction of municipal solid waste derived from animal or vegetable sources, and can generally be degraded by microorganisms

Pourashava: It is a local term for municipality.

Recyclable: Materials that still have useful physical or chemical properties after serving their original purpose and that can, therefore, be reused or remanufactured into additional products.

Source Separation: The segregation of specific materials at the point of generation for separate collection, Residences source separate recyclables as part of recycling program.

Small Scale Composting Plants: Generally labor intensive and involves less capital and produces compost less than 50 ton per day

Solid Waste Management: Systematic control of generation, storage, collection, transport, separation, processing, recycling, recovery and final disposal of solid waste

Urban Solid Waste: Means all solid waste generated in an urbanized area except industrial and agricultural waste

ABBREVIATIONS

BBS	Bangladesh Bureau of Statistics
BARC	Bangladesh Agricultural Research Council
CDM	Clean Development Mecahnism
CERS	Certified Emission Reduction
DAE	Department of Agricultural Extension
DOE	Department of Environment
FAO	Food and Agricultural Organization
GoB	Government of Bangladesh
Ha	Hectare
HH	Households
ISO	International Standardization Organization
PRSP	Poverty Reduction Strategy Paper
Tk.	Taka

CONVERSION EQUIVALENT

1 Hectare	10000 m ²
1 Hectare	2.47 acre
1 Acre	43,560 sq.ft
1 Acre	0.4046856 Hectare
1 Bigha	14,400 square feet (20 Katha)
1 Katha	720 square feet
1 Lac	100,000
1 Crore	10,000,000

TABLE OF CONTENTS

EXECUTIVE SUMMARY	
ABBREVIATIONS	
TABLE OF CONTENTS	
LIST OF FIGURES	
LIST OF TABLES	
LIST OF PLATES	

CHAPTER 1	INTRODUCTION	1
1.1	Background	1
1.2	Objectives of the Study	1
1.3	Methodology	2
CHAPTER 2	AN OVERVIEW OF RANGPUR	4
2.1	Background	4
2.2	Soil Condition	4
2.3	Ground Water Condition	4
2.4	Types of Crop Cultivated and Fertilizer Consumption in Rangpur	8
CHAPTER 3	PRESENT USE AND AVAILABILITY OF BIOMASS IN RURAL AREAS	9
3.1	Quantity of Solid Waste Disposed by Households	9
3.2	Physical Composition and Density of Solid Waste	10
3.3	Current Solid Waste Disposal Practices in Rural Rangpur	11
3.3.1	Disposal of Organic Waste	11
3.4	Source of Fuel	13
3.5	Air Pollution Problem	15
3.6	Availability of Livestock and Means of Tillage	16
3.7	Knowledge About Waste Composting and Willingness to Buy Compost	18
3.8	Impacts of Improper Management of Organic Waste	20
3.9	Impact of Climate Change on Agriculture	21
3.10	Present Practice of Irrigation	21
3.11	Availability of Biomass	23
3.12	Demand and Supply Situation of Compost in Rangpur	24
3.13	Problems with Agriculture	24
CHAPTER 4	PRESENT USE AND AVAILABILITY OF BIOMASS IN URBAN RANGPUR	26
4.1	Quantity of Solid Waste	26
4.2	Physical Composition of Solid Waste	27
4.3	Density of Solid Waste	28
4.4	Opinion of Community about Present State of Solid Waste Management	28
4.5	Problems Due to Improper Management of Solid Waste	29
4.6	Place of Waste Disposal and Removal of Waste by the Pourashava	29
4.7	Frequency of Waste Collection Preferred	30
4.8	Willingness to Pay for Improvement of Waste Management System of the Community	31
4.9	Response Regarding Participation in On-Site (Barrel Type Composting) and Community Based Composting	31
4.10	Type and Source of Fuel	31
4.11	Average Number of Tree and Quantity of Twigs	33
4.12	Average Number of Cattle and Quantity of Dung	33
4.13	Total Availability of Biomass	33

CHAPTER 5	MARKETING CHANNEL OF COMPOST IN RANGPUR	34
5.1	Amount of Organic Fertilizer Sold by Dealers and Retailers	34
5.2	Amount of Enriched Organic Fertilizer Sold by Dealers and Retailers	35
5.3	Total Amount of Compost and Enriched Organic Fertilizer Sold in Rangpur	35
5.4	Response of Dealer and Retailer Regarding Sale of Compost During Last Few Years	36
5.5	Types of Compost Sold in Rangpur	37
5.6	Source of Information About of Compost	37
5.7	Suggested Steps to Increase Sale of Compost	37
CHAPTER 6	BUSINESS MODELS FOR SCALING UP OF COMPOST PRODUCTION	39
6.1	Opportunity of Scaling up of Compost Production in Rural Areas	39
6.2	Barriers in Scaling up of Compost Production	39
6.3	Strategy to Scale up Compost Production and to Overcome the Barriers	40
6.3.1	Option 1: Change the Existing Composting Technology of Farmers to Increase Compost Production	40
6.3.2	Option 2: Provide Farmers with Improved Stove and Composting Technology to Increase Compost Production	42
6.3.3	Private Entrepreneur Investing in the Compost Plant as a Commercial Venture in Rural Areas	45
6.3.4	Production of Compost in Urban and Peri Urban Areas Using Private Sector and CDM Based Investment	48
CHAPTER 7	CONCLUSION AND RECOMMENDATION	52
7.1	Key Findings	52
7.2	Recommendations	53
	REFERENCES	55
	ANNEX	56

LIST OF FIGURES

Figures	Title	Page
2.1	Base Map of Rangpur District	5
2.2	Map of Organic Matter Content of Rangpur District	6
2.3	Ground Water Map of Rangpur District	7
3.1	Income Group Wise Waste Generation Rate (Kg/cap/day)	9
3.2	Physical Composition and Density of Solid Waste	10
3.3	Use of Kitchen Waste by the Farmers	11
3.4	Use of Agricultural Waste by the Farmers	12
3.5	Use of Animal Dung by the Farmers	12
3.6	Comparison of Biomass Consumption as Fuel	14
3.7	Problem Faced During Cooking	16
3.8	Use of Poultry Droppings by Farmers	17
3.9	Present Use of Compost	18
3.10	Reason for Use of Compost	18
3.11	Problem Faced During Composting	19
3.12	Response regarding decrease in crop yield	20
3.13	Problems with Irrigation	22
3.14	Problems with Irrigation	22
3.15	Availability and Use of Biomass in Rangpur	24
4.1	Domestic Waste Generation Rate in the Urban Areas of Rangpur District	26
4.2	Average Physical Composition of Solid Waste	28
4.3	Satisfaction Level of Respondents	28
4.4	Rating of Municipal Waste Management Services	29
4.5	Current Place of Waste Disposal	30
4.6	Preferred Frequency of Waste Collection	30
4.7	Collection Mode of Fuel	32
5.1	Reasons Identified by Retailers for Increase in Sale of Compost	36
5.2	Recommended Measures by Retailers to Improve the Sale of Compost	38
6.1	Different Cluster Types For Implementation of Compost Plant	47

LIST OF TABLES

Table	Title	Page
2.1	Current Cropping Pattern of Different Thanas	8
2.2	Present and Past Fertilizer Usage Dose	8
3.1	Household Income and Waste Generation Rate by Village Under Thanas	9
3.2	Density of Solid Waste	10
3.3	Type of Fuel Used Per Month Per Household (kg/month)	13
3.4	Comparison of Type of Fuel Used in Rangpur and in Bangladesh	13
3.5	Health Effects of Exposure to Smoke from Biomass Based Fuel	16
3.6	Average Number of Livestock Per Household	16
3.7	Means of Tillage at Eco villages	17
3.8	Reasons Identified for Decrease in Productivity	20
3.9	Problems Identified by the Framers Relating to Changing Weather	21
3.10	Changed Crop Due to Weather Change	21
3.11	Means of Irrigation at Rangpur	21
3.12	Agricultural Waste Generated in Rangpur	23
3.13	Waste Generated in Rangpur	23
3.14	Crop Wise Demand for Compost	24
3.15	Priority Wise Problems Regarding Agriculture	25
4.1	Average Domestic Waste Generation Rate in Rangpur District	26
4.2	Average Domestic Waste Generation Rate in Urban Areas of Rangpur	26
4.3	Average Waste Generation Rate of Urban Areas of Rangpur	27
4.4	Total Waste Generated in Urban Areas of Rangpur	27
4.5	Average Physical Composition of Solid Waste in the Urban Areas of Rangpur	27
4.6	Reasons for Pollution Due to Present Solid Waste Management System	29
4.7	Problem Due to Improper Disposal of Waste	29
4.8	Frequency of Waste Removal by the Pourashavas	30
4.9	Willingness to Financially Contribute for House-to-House Waste Collection according to Income Group	31
4.10	Type of Fuel Used by Different Income Groups	31
4.11	Sources of Fuel	32
4.12	Average Expenditure of Fuel for Cooking	32
4.13	Average Number Trees By Pourashavas	33
5.1	Average Amount of Compost Sold By a Retailer	34
5.2	Average Amount of Enriched Compost Sold By a Retailer	35
5.3	Source of Information for Retailer	37
6.1	Present Status of Demand-Supply Situation of Compost in Rangpur	39
6.2	Risk Analysis for Option-1	42
6.3	Risk Analysis for Option-2	44
6.4	Land, Manpower and Estimated Cost Involvement for Installation of Different Capacity of Decentralized Composting Plant in Rangpur	46
6.5	Sensitivity Analysis	47
6.6	Risk Analysis for Option-3	48
6.7	Land, Manpower and Estimated Cost Involvement for Installation of Different Capacity of Decentralized Composting Plant in Different Municipalities of Rangpur	49
6.8	Sensitivity Analysis for 3 Tons/day Plant in Urban Area	49
6.9	Risk Analysis for Option-4	50
6.10	Different Options for Scaling up of Compost Production	51

LIST OF PLATES

Plate	Titles	Page
3.1	Use of organic waste as an animal feed	11
3.2	Use of cow dung as fuel	13
3.3	Use of Cow dung as Fuel	14
3.4	Use of Firewood as Fuel	15
3.5	Use of Twigs as Fuel	15
3.6	Local Composting Technique Followed by the Farmers	19
3.7	Local Composting Technique Used By the Farmers	20
5.1	Samples of Compost Being Sold in Rangpur	34
5.2	Samples of Compost Being Sold in Rangpur	35
6.1	Low cost composting technology (aerobic)	41
6.2	Low cost composting box using bamboo	41
6.3	Energy Efficient Improved Stove	43
6.4	Compost Produced By Private Entrepreneur	45
6.5	Compost Produced By Private Entrepreneur Sold in 50 kg/bag	46